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change of position of réseau-lines when the direction of the source of illumination changes. It has accordingly been found necessary to use an adjustable clamp, to press the two surfaces into contact in the neighbourhood where measurements are being taken. The use of plate glass would obviate the necessity of this precaution; but the fact remains that it has not been used, nor have réseaux been impressed on the negatives, and it is accordingly a matter of great interest that experience in dealing with the plates actually in existence should be recorded.

Photographic and Visual Magnitudes of α Orionis.

By W. H. Robinson.

(*Communicated by A. A. Rambaut, M.A., Sc.D., F.R.S., Radcliffe Observer.*)

Since Mr. Packer's announcement concerning the increase of brightness of α *Orionis* several photographs of the region of the sky including this star have been secured, the half-plate camera used being that employed last year in the determination of the photographic magnitude of *Nova Persei*. The results of the latter investigation were published in the *Monthly Notices* of the R.A.S., vol. lxii., Nos. 3 and 6. In No. 3 the writer drew attention incidentally to the chemically active quality of the light of the new star on 1901 March 9, and contrasted with it the non-actinic character of the light of α *Orionis*, which at the time was visually similar to it in colour. This photograph has now become additionally useful, being included with the recent photographs in the following discussion.

In the present paper the methods of measurement of images and reduction of results for α *Orionis* are precisely similar to those adopted for *Nova Persei*.

Nine comparison stars have been selected in determining the scale of brightness. The names of these, with their tabular (Harvard) magnitudes and mean measured photographic brightness, are as follows:—

Name of Star. *Orionis.*	Tabular Magnitude.	Scaled Photographic Brightness (Means).
γ	1·75	20·0
ε	1·75	28·2
ζ	1·9	28·4
δ	2·5	31·1
η	3·45	50·3
λ	3·5	45·8
σ	3·75	53·2
A	4·4	56·6
ϕ^1	4·4	58·8

Plotting the above values on square-ruled paper, and drawing

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a smooth curve through them, the magnitude equivalents for arbitrary scale were found to be:

Scale.	Magnitude Equivalent.	Scale.	Magnitude Equivalent.
20	1·52	45	3·38
25	1·87	50	3·76
30	2·26	55	4·13
35	2·64	60	4·50
40	3·01		

The equivalents were then adopted for forming the photographic magnitudes of α *Orionis*, which, together with the visual magnitudes, are exhibited in the following table. The visual magnitudes are only approximate, since they depend upon comparison with two stars only, viz. *Capella* and *Rigel*, which differ greatly from α *Orionis* in colour and position. Their widely differing zenith distances rendered necessary the application of corrections for atmospheric absorption, the formula adopted being

$$A = 0{\cdot}25\ (\text{sec. } Z - 1).$$

The small differential residuals of these corrections have been allowed for in column 5.

Ref. No.	G.M.T.		Sealed Readings.	Photographic Magnitudes.	Visual Magnitudes. *Corrected* for Atmospheric Absorption.	Visual Magnitudes. *Uncorrected* for Atmospheric Absorption.
	1901.	h				
1	Mar. 9	9½	38·8	2·92*	(0·91)†	(0·91)†
	1902.	h				
2	Oct. 22	12½	35·6	2·68	...	...
3	Nov. 8	11 −	36·9	2·78	0·23	0·25
4	8	11 +	37·4	2·82	0·23	0·25
5	12	12	38·3	2·88	0·27	0·25
6	28	11	...	...	0·27	0·25
7	Dec. 1	11	...	...	0·27	0·25
8	3	10	...	...	0·29	0·29
9	4	11	...	...	0·29	0·29
10	6	11	38·6	2·91	0·29	0·29

Remarks.—1. Photographed on same plate with *Nova Persei.* The values in cols. 5 and 6 marked thus ( )† are taken from Harvard Photometry. 2. Light clouds passing at times; moonlight. 3, 4, 5. To the naked eye α *Orionis* is certainly brighter than *Rigel* and distinctly fainter than *Capella.* 8. α *Orionis* is not so bright to-night to the naked eye; it is nearer *Rigel* than *Capella* in magnitude. 9, 10. α *Orionis* between *Capella* and *Rigel* in brightness, nearer *Rigel.*

**Erratum.*—P. 199 of vol. lxii., α *Orionis.* Photographic magnitude. *For* 3·20 *read* 2·92, the latter being the definitive value, the former only a provisional one.

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During the period 1902 Oct.–Dec. the observers at Oxford have several times noted an unusually crystalline image of *α Orionis*. The star *Capella* has generally been observed by the writer to be about one magnitude brighter than *Rigel*. Allowing for the effect of atmospheric absorption, a difference exists of about 0·6 or 0·7, which is sensibly greater than that given in the Harvard Photometry, viz. 0·14. Within small limits these two comparison stars are probably variable, as suggested by W. Struve and Argelander respectively, and by others.

It will be seen in the preceding table that between 1901 March 9 and 1902 October 22 the photographic magnitude of *α Orionis* had increased, but only slightly. Since October 22, however, a gradual decline appears to have set in. The evidence afforded by the visual estimates, and by the remarks appended to them, also confirms not only the brightening between the two first dates, but the slight decrease which appears to have taken place subsequently.

Radcliffe Observatory, Oxford:
1902 *Dec.* 10.

Cape Double Star Results, 1902. By R. T. A. Innes.

(*Communicated by Sir David Gill, K.C.B., F.R.S., H.M. Astronomer.*)

The winter was a very wet one, so that very few nights were available for double-star work. Through leave of absence, observations ceased early in August. All the measures were made with the Repsold micrometer on the 18-inch refractor. In the cases of a few newly discovered pairs estimates only have been secured: these were generally made at the 7-inch refractor.

A few measures previously omitted are included.

The measures of α Centauri will be found on p. 81.

The screw-value used in 1902 is 17″·600.

The colour scale used and the general arrangement of the results are as in 1901. See *Monthly Notices*, vol. lxii. pp. 470–484.

Incidentally it was found that the star G.P.Z. 7641, mag. 8·7, occupies the centre of a round nebula of about 3′ diameter, and it is therefore a nebulous star. Its position is:

	h	m	s	°	′
1860	11	5	32	−75	51·2
1875	11	6	1	−75	56·3
1900	11	6	49	−76	4·4

Mag. in the C.P.D. = 8·6.